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Amendments to the Claims:

The listing of claims below replaces all previous versions of the claims in this application.

1. (Currently Amended) A method for analyzing composition of a body portion, comprising:

determining a size and a position of the body portion by imaging a nuclear magnetic resonance parameter of a body in at least one dimension;

inducing a static magnetic field and a gradient magnetic field in at least the body portion;

inducing a radio frequency magnetic field in at least the body portion at a frequency selected to excite nuclear magnetic resonance phenomena;

detecting nuclear magnetic resonance signals from at least the body portion, the static magnetic field and the gradient magnetic field having amplitudes selected such that the nuclear magnetic resonance phenomena are induced and detected substantially entirely within the body part**; and**

determining an amount of at least one constituent in the body part from the detected nuclear magnetic resonance signals.

2. (Original) The method of claim 1 wherein the nuclear magnetic resonance imaging comprises performing a Carr Purcell Meiboom Gill sequence on each of a plurality of image sections, each image section localized by applying to at least the body portion a static magnetic field and a gradient magnetic field having amplitudes selected to localize excitation of nuclear magnetic resonance phenomena within each image section corresponding to the selected radio frequency.

3. (Original) The method of claim 2 wherein the size and position of the body component are determined by a total nuclear magnetic resonance signal amplitude with respect to a position of each image section.

4. (Original) The method of claim 1 further comprising analyzing a composition of the body portion by determining relative fractions of each of a plurality of components, each of the

components having a unique transverse nuclear magnetic relaxation time.

5. (Original) The method of claim 1 further comprising analyzing a composition of the body portion by determining relative fractions of each of a plurality of components, each of the components having a unique longitudinal nuclear magnetic relaxation time.

6. (Original) The method of claim 1 wherein the inducing the radio frequency magnetic field and the detecting nuclear magnetic resonance signals is substantially localized with respect to the body portion.

7. (Currently Amended) A system for body portion composition analysis, comprising:

a magnet for inducing a static magnetic field in a body;

means for inducing radio frequency magnetic fields in the body;

means for detecting nuclear magnetic resonance phenomena in the body;

means for applying a selected amplitude gradient magnetic field to the body; and

means for selectively controlling amplitude of the static magnetic field in the body, the means for applying the gradient field and the means for controlling amplitude configured to image a nuclear magnetic resonance property of the body in at least one dimension at a selected radio frequency, the means for applying the gradient field and means for controlling amplitude configured to cause excitation of nuclear magnetic resonance phenomena in a portion of the body having a selected position and size, the size being smaller than a size of the body**; and**

means for determining an amount of at least one constituent in the body part from the detected nuclear magnetic resonance signals.

8. (Original) The system of claim 7 further comprising means for analyzing composition of the portion of the body from detected nuclear magnetic resonance signals.

9. (Currently Amended) A method for analyzing body composition, comprising:

inducing a static magnetic field in the body, the static magnetic field having a known distribution along a longitudinal axis of the body;

inducing a radio frequency magnetic field in the body, the radio frequency and a bandwidth thereof selected to induce nuclear magnetic resonance phenomena in a selected axial segment along the body; ~~and~~

detecting nuclear magnetic resonance phenomena from the selected axial segment; **and**

determining an amount of at least one constituent from the detected nuclear magnetic resonance signals.

10. (Currently Amended) The method of claim 9 further comprising repeating the inducing the radio frequency magnetic field ~~and the~~ ,detecting nuclear magnetic resonance signals in at least one different selected axial segment**, and determining amount of the at least one constituent** by at least one of applying a selected additional static magnetic field to the body and changing a frequency of the radio frequency magnetic field.

11. (Currently Amended) The method of claim 10 further comprising repeating the inducing the radio frequency magnetic field ~~and~~, detecting the nuclear magnetic resonance signals **and determining amount of the at least one constituent** in different axial segments until substantially the entire body is analyzed.

12. (Canceled)

13. (Currently Amended) The method of claim ~~12~~ **11** further comprising determining a distribution of composition along the axis of the body.

14. (Original) The method of claim 9 further comprising analyzing a composition of the selected axial segment from the detected nuclear magnetic resonance signals.

15. (Original) The method of claim 9 wherein the inducing the radio frequency magnetic field comprises performing a Carr Purcell Meiboom Gill sequence having substantially equal duration excitation and refocusing pulses

16. (Original) The method of claim 10 wherein the different axial segment is selected so as to be not contiguous with the selected axial segment, thus reducing interference between the nuclear magnetic resonance signals detected in each axial segment.

17. (Canceled)

18. (Original) The method of claim 9 wherein an amplitude of the static magnetic field and a frequency of the radio frequency magnetic field are selected such that a selected value of signal to noise ratio is determined with respect to a volume of the axial segment.

19. (Original) The method of claim 9 further comprising applying a gradient magnetic field to the body, the gradient magnetic field being larger than any gradients in the static magnetic field in a direction along the longitudinal axis of the body.

20. (Currently Amended) A system for analyzing body composition, comprising:

means for inducing a static magnetic field in the body, the static magnetic field having a known distribution along a longitudinal axis of the body;

means for inducing a radio frequency magnetic field in the body, the radio frequency and a bandwidth thereof selected to induce nuclear magnetic resonance phenomena in a selected axial segment along the body;

means for detecting nuclear magnetic resonance phenomena from the selected axial segment; ~~and~~

means for determining amount of at least one constituent in the selected axial segment from the detected nuclear magnetic resonance signals; and

means for repeating the inducing the radio frequency magnetic field and the detecting nuclear magnetic resonance signals in a different selected axial segment, the means for repeating including at least one of means for changing an amplitude of the static magnetic field applied to the body and a means for changing a frequency of the radio frequency magnetic field.

21.(Canceled)

22. (Original) The system of claim 20 wherein the means for inducing the radio frequency magnetic field comprises means for performing a Carr Purcell Meiboom Gill sequence.

23. (Original) The system of claim 20 wherein the means for selecting different axial segment is adapted such that the different axial segment is not contiguous with the selected axial segment, thus reducing interference between the nuclear magnetic resonance signals detected in each axial segment.

24. (Original) The system of claim 20 wherein the means for repeating the inducing and detecting is adapted to enable repetition in different axial segments along the body until substantially the entire body has been analyzed.

25. (Original) The system of claim 20 wherein an amplitude of the static magnetic field and the radio frequency magnetic field are selected such that a selected value of signal to noise ratio is determined with respect to a volume of the axial segment.

26. (Original) The system of claim 20 further comprising means for applying a gradient magnetic field to the body, the gradient magnetic field being larger than any gradients in the static magnetic field in a direction along the longitudinal axis of the body.

27. (Original) The system of claim 20 wherein a nuclear magnetic resonance signal sensitivity is substantially spatially uniform within each selected segment.

28. (Currently Amended) A method for analyzing composition of a body, comprising;

inducing a static magnetic field along a selected axial segment of the body, the static magnetic field being substantially homogeneous in a direction perpendicular to a longitudinal axis of the body and having a known amplitude distribution along the longitudinal axis;

inducing a radio frequency magnetic field in the selected axial segment, the radio frequency magnetic field being substantially perpendicular to the static magnetic field and being substantially homogeneous along the longitudinal axis at a known position, a frequency and bandwidth of the radio frequency magnetic field selected to induce nuclear magnetic resonance phenomena in the known position;

detecting nuclear magnetic resonance signals from the body at the known position; ~~and~~

determining amount of at least one constituent in the body part from the detected nuclear magnetic resonance signals

moving the static magnetic field and the radio frequency magnetic field with respect to the body along the longitudinal axis such that the known position is in a different axial portion of the body, and repeating the inducing the static magnetic field, the inducing the radio frequency magnetic field and the detecting.

29. (Currently Amended) The method of claim 28 further comprising repeating the moving, inducing the static and radio frequency magnetic fields ~~and~~ the detecting **and the determining** at different known positions along the body until substantially the entire body is analyzed.

30. (Canceled).

31. (Original) The method of claim 28 wherein the inducing the radio frequency magnetic field comprises performing a Carr Purcell Meiboom Gill sequence having substantially equal duration excitation and refocusing pulses.

32. (Currently Amended) A system for analyzing composition of a body, comprising;

means for inducing a static magnetic field along a selected axial segment of the body, the static magnetic field being substantially homogeneous in a direction perpendicular to a longitudinal axis of the body and having a known amplitude distribution along the longitudinal axis;

means for inducing a radio frequency magnetic field in the selected axial segment, the radio frequency magnetic field being substantially perpendicular to the static magnetic field at a known position along the longitudinal axis, a frequency and bandwidth of the radio frequency magnetic field selectable to induce nuclear magnetic resonance phenomena in the known position; ~~and~~

means for detecting nuclear magnetic resonance signals from the known position; **and**

means for determining an amount of at least one constituent from the detected nuclear magnetic resonance signals.

33. (Original) The system of claim 32 further comprising means for moving the static magnetic field and the radio frequency magnetic field with respect to the body along the longitudinal axis such that the known position is in a different axial portion of the body.

34. (Original) The system of claim 32 further comprising means for determining a composition of the body at the known position from the detected nuclear magnetic resonance signals.

35. (Original) The system of claim 32 further comprising means for determining a composition distribution of the body along the longitudinal axis.

36. (Original) The system of claim 32 wherein the means for inducing the radio frequency magnetic field comprises means for performing a Carr Purcell Meiboom Gill sequence.

37. (Original) The system of claim 32 further comprising means for minimizing spatial variation in nuclear magnetic resonance signal sensitivity within the known position.